

# Çağatay Demiralp

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## RESEARCH OVERVIEW

My research interests lie in developing models, algorithms, and interactive tools to explore, understand, and characterize patterns and structures in data. The focus of my PhD work has been *computational brain connectivity*, where I *model*, *visualize*, and *analyze* brain white-matter connectivity at the scale provided by diffusion imaging.

## EDUCATION

Ph.D., Computer Science, Brown University, Providence, RI (2006 - present)  
Ph.D., Computer Science, University of Utah, Salt Lake City, UT (Jan - Dec 2005)  
Sc.M., Computer Science, Brown University, Providence, RI (2004)  
B.Sc., Computer Engineering, Ege University, İzmir, Turkey (2000)

## RESEARCH EXPERIENCE

Research Intern, Machine Learning and Perception Group at Microsoft Research Cambridge (Fall 2011)  
Graduate Research Assistant, Computer Science Dept, Brown University (2006-present)  
Graduate Research Fellow, NLM at the National Institutes of Health (Nov - Dec 2004)  
Visiting Research Fellow, Centre for Neuroimaging Sciences, King's College London (Summer 2004)  
Graduate Research Assistant, Computer Science Dept, Brown University (2002-2004)  
Staff Researcher, Computer Science Dept, Brown University (2000-2002)  
Visiting Ugrad Research Assistant, Computer Science Dept, Brown University (May - Sep 1999)  
Ugrad Research Intern, Fraunhofer Center for Research in Computer Graphics (Nov 1998 - May 1999)

## AWARDS & HONORS

Best Poster Award at IEEE Visualization Conference (2010)  
Brain Science Graduate Research Award (2008)  
Best Scientific Content and Best Layout and Presentation awards at the American Society for Surgery of the Hand 56th Annual Meeting (2001)

## BOOK CHAPTERS

1. Exploring Brain Connectivity with Two-dimensional Maps. **Ç. Demiralp**, R. Jianu, and D. H. Laidlaw. *New Developments in the Visualization and Processing of Tensor Fields*. LNCS-Springer, 2012.

## JOURNAL PUBLICATIONS

6. Exploring Brain Connectivity with Two-dimensional Neural Maps. R. Jianu, **Ç. Demiralp**, and D. H. Laidlaw. *IEEE Trans. Vis. Comput. Graphics*, 2011.
5. Coloring 3D Line Fields Using Boy's Real Projective Plane Immersion. **Ç. Demiralp**, J. F. Hughes, and D. H. Laidlaw. *IEEE Trans. Vis. Comput. Graphics (Proc. IEEE Visualization)*, 2009.
4. Exploring 3D DTI fiber-tracts with linked 2D representations. R. Jianu, **Ç. Demiralp**, and D. H. Laidlaw. *IEEE Trans. Vis. Comput. Graphics (Proc. IEEE Visualization)*, 2009.
3. A Qualitative and Quantitative Comparison of CAVE and Fish Tank Virtual Reality Displays. **Ç. Demiralp**, C. D. Jackson, D. B. Karelitz, S. Zhang, and D. H. Laidlaw. *IEEE Trans. Vis. Comput. Graphics*, 2006.
2. In-vivo Measurement of Contact Areas and Ligament Lengths in the Distal Radioulnar Joint. G. E. Marai, D. H. Laidlaw, **Ç. Demiralp**, S. Andrews, C. M. Grimm, and J. J. Crisco. *IEEE Trans. Biomed. Eng.*, 2004.
1. Visualizing Diffusion Tensor MR Images Using Streamtubes and Streamsurfaces. S. Zhang, **Ç. Demiralp**, and D. H. Laidlaw. *IEEE Trans. Vis. Comput. Graphics*, 2003.

## CONFERENCE PUBLICATIONS

8. Generalizing Diffusion Tensor Model using Probabilistic Inference in Markov Random Fields. **Ç. Demiralp** and David H. Laidlaw. *Proc. MICCAI Workshop on Computational Diffusion MRI*, 2011.
7. Tract-based Probability Densities of Diffusivity Measures in DT-MRI. **Ç. Demiralp** and D. H. Laidlaw. *Proc. MICCAI*, 2010.
6. Surface Deformations Driven by Vector-Valued 1-Forms. G. Taubin and **Ç. Demiralp**. *Proc. Shape Modeling International*, 2010.
5. Similarity Coloring of DTI Fiber Tracts. **Ç. Demiralp** and D. H. Laidlaw. *Proc. MICCAI Workshop on Diffusion Modeling and the Fibre Cup*, 2009.
4. Slicing-based coherence measure for refining clusters of 3D curves. **Ç. Demiralp**, G. Shakhnarovich, S. Zhang, and D. H. Laidlaw. *Proc. MICCAI*, 2008.
3. Connectivity-aware Sectional Visualization of 3D DTI Volumes Using Perceptual Flat-torus Coloring and Edge Rendering. **Ç. Demiralp**, S. Zhang, D. F. Tate, S. Correia, D. H. Laidlaw. *Eurographics*, 2006.
2. An Immersive Virtual Environment for DT-MRI Volume Visualization Applications: A Case Study. S. Zhang, **Ç. Demiralp**, D. F. Keefe, M. J. da Silva, D. H. Laidlaw, B. D. Greenberg, P. J. Bassler, E. A. Chiocca, C. Pierpaoli T. S. Deisboeck. *IEEE Visualization*, 2001.
1. Application of Virtual Reality to Visualization of DT-MRI Volumes. S. Zhang, **Ç. Demiralp**, D. F. Keefe, M. J. da Silva, D. H. Laidlaw, B. D. Greenberg, P. J. Bassler, E. A. Chiocca, C. Pierpaoli, T. S. Deisboeck. *Proc. MICCAI*, 2001.

## CONFERENCE ABSTRACTS & POSTERS

[More than 10; visit <http://vis.cs.brown.edu/organization/people/cad.html> for a complete list.]

## PANELS

- Theories of Visualization—Are There Any? *IEEE VisWeek* (2011)

## INVITED TALKS

- Cycles of Brain White Matter, *Dagstuhl Seminar* (2011)
- Exploring Brain Connectivity with Two-dimensional Neural Maps, *University College London* (2011)
- Coloring 3D Line Fields Using Boy's Real Projective Plane Immersion, *University of New Hampshire* (2010)
- Manifold Ways of Coloring, *Dagstuhl Seminar* (2009)

## TEACHING EXPERIENCE

Teaching Assistant, Computational Topology, Brown University (Spring 2011)

Teaching Assistant, Discrete Mathematics, University of Utah (Fall 2005)

Teaching Assistant, Advanced Algorithms & Data Structures, University of Utah (Spring 2005)

## SERVICE

Organizer, VisWeek'11 Panel, *Theories of Visualization—Are There Any?*

Reviewer, *CHI*, *EuroVis*, *PacificVis*, *IEEE Visualization*, *IEEE Trans. Vis. Comput. Graphics*, *MICCAI*

Organizer, Brown SciVis Seminars by *Mert R. Sabuncu*, *Ofer Pasternak*, *Miriah Meyer*, *Won-Ki Jeong*, *Peter Savadjiev*

PhD Admission Committee Member (2011)

Faculty Search Czar (2009 - 2010)

Department L<sup>A</sup>T<sub>E</sub>X Administrator (2007 - 2011)

## MEDIA COVERAGE

“Researchers map, measure brain’s neural connections” *ScienceDaily et al.*

“A New Way to Look at the Brain Using Google Maps” *Gizmodo et al.*